

H-Canyon Assessment Summary

A multidisciplinary team of experts conducted an assessment of the Confinement Ventilation Systems (CVS) of H-Canyon at the SRS. The assessment included all Systems, Structures, and Components (SSC) that comprise the H-Canyon CVS under "scope of assessment" of this report. To conduct the assessment the assessment team reviewed a number of documents describing the CVS, excerpts from the AB documents, and representative surveillance procedures. The assessment team also received presentations, conducted interviews with appropriate facility staff, and participated in tours of the facility to evaluate material condition and configuration management of the system as recommended in the assessment criteria and guidance.

Based on review of documents, interviews with facility engineering staff, presentation material, and facility tours to validate the information, the assessment team made the following conclusions with respect to the two objectives of the assessment:

1. Objective 1, to evaluate the effectiveness of the Criteria and Guidance for conduct of Phase II assessment, was met. The Criteria and Guidance were found to be generally effective for assessing the readiness to service and operability of a Vital Safety System (VSS), provided the assessment team possesses the requisite expertise and experience relevant to the system being assessed. The assessment team did recommend several changes to further enhance the effectiveness of the Criteria and Guidance. These recommendations were either discussed with the representative from the Office of Environment, Safety, and Health during the team's daily meetings and/or are identified in the assessment report.
2. Objective 2, to accomplish a Phase II assessment of H-Canyon CVS, was also met. The assessment covered a majority of the SSC associated with the entire CVS and concluded that all criteria were met. The assessment particularly focused on the Safety Class SSC of the system and concluded that there are no issues or concerns that would bring into question readiness to service or operability of the H-Canyon CVS.

In Recommendation 2000-2 the Board expressed concern that many DOE nuclear facilities were constructed years ago and are approaching the end of their design life. The Board concluded that confinement ventilation systems were degrading and might be approaching unacceptable levels of reliability and operability. As facilities age, a combination of age-related degradation and deficient maintenance may affect the reliability and ability to the system to perform its safety functions as designed.

The assessment team recognized the aging condition of various structures, systems, and components. Degradations of SSC were particularly notable from a team review of:

- historical photographs and videotapes of the old F & H sand filters and exhaust tunnels which indicate scattered settlement of the sand pile over the years and degradation of concrete structures;
- the project to replace the main canyon exhaust fans due to deteriorating fan performance;
- the pending project to seal air leakage at the joint between the concrete exhaust tunnel and the metal plenum to the stack; and

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- the pending project to address the in-leakage from the canyon exhaust tunnel into the 3rd & 4th level HB-Line exhaust duct.

Because of this information, the assessment team devoted attention to the processes and programs for monitoring and managing degradation as components age (maintenance, inspection, refurbishment, and performance monitoring) to support "long term" system operability in addition to assessing "current" system operability.

The team felt that the reliability and operability of the CVS, although aging, was being monitored for deterioration and upgraded where required, based on the inspections, predictive maintenance, corrective maintenance, and preventative maintenance plans in-place. Some examples of the plans in-place or actions being taken that the team based their conclusions on are:

- the periodic 7 year structural integrity inspection of the stack, that uncovered air leakage at the joints;
- addition of a second sand filter in H Area, because of degradation monitored in the F-Area sand filter;
- replacement of the main canyon exhaust fans, due to monitoring of the deterioration of the fans performance;
- discovery of the in-leakage from the H-Canyon exhaust tunnel into the HB-Line exhaust duct, due to monitoring of the 3rd & 4th level HB-Line exhaust system;
- the in-place plan for periodic testing and inspection of the sand filter (discussed in detail in Appendix "A,");
- the facilities' newly developed predictive maintenance plan, which will complement and reduce the required effort for corrective maintenance and preventative maintenance plans presently in place; and
- the Integrated System Reliability Program (ISRP).

While the team recognized the viability and value of these programs for supporting long term operability of CVS, the team also identified several opportunities for improvement to further enhance the operability of the H-Canyon CVS over the life of the facility as follows:

- In some cases there is an excessive lag time in updating drawings following facility modifications;
- Fan and machinery mounts in the H-Canyon central section supply fan room may undergo long-term degradation if the condensation problem is not resolved;
- The evaluation by the system engineer to establish maximum operating life of the HEPA filters is not documented;
- Suggest the visual inspection of sand filter be made a requirement and be conducted at the same time as the periodic sand filter efficiency test;
- Sand Filter efficiency test procedure should be developed (instead of using the HEPA filter test procedure);
- Recommend 99.51% efficiency test of Sand Filter be tied to the type of tests performed and the particle size used; and

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- Long term reliability of support systems would be enhanced if an in service piping inspection program per ANSI B-31.3 were initiated.

The assessment team also noted a number of proficiencies at H-Canyon. These proficiencies were identified to encourage continued emphasis and benefit and are identified below:

- Integrated System Reliability Program (ISRP);
- Predictive Maintenance Program;
- System Engineering Program and System Engineers' competence; and
- Linking Document Database: good tool for safety basis integration and configuration management.